JOURNAL OF MYCOLOGY.

Vol. II. MANHATTAN, KANSAS, FEBRUARY, 1886. No. 2.

THE PHYLLOSTICTAS OF NORTH AMERICA.

BY GEORGE MARTIN.

PHYLLOSTICTA, PERS.; FRIES. S. M., 2, p. 257.

(Etym. *phyllon* leaf and *stictos*, pricked or spotted, a punctate or spotted leaf.) Perithecia lenticular, thinly membranaceous, covered by the epidermis, but often protruded, punctiform, growing in discolored areas of leaves, and rarely of branches. Sporulæ small, ovoid, entire, hyaline, or light green; basidia very small, or none. SYLLOGE FUNGORUM, 3, p. 3.

They have been separated into two classes, for convenience:

A. Those found on trees, shrubs or woody plants.

B. Those found on herbaceous plants.

Descriptions that have been copied without being verified are enclosed in quotation marks.

A. Those found on trees, shrubs or woody plants.

1. PHYLLOSTICTA ACERICOLA, Cke. & Ell. Grev., p. 61.

(*Sphæropsis minima*, B. & C.) Grev., III, p. 2.; Ellis, N. A. F., No. 534.

Epiphyllous; spots pallid, 5—8 millim. in diam., border purple; perithecia brown-black, globose, scattered, 120 μ; sporulæ ovate, hyaline, 8—9 x 5—6 μ. On maple leaves.

2. PHYLLOSTICTA ABORTIVA, E. & K. Journ. Mycol., I, 4.

Spots brown, suborbicular, .25—1 cm., with a definite, darker colored, scarcely raised margin; perithecia innate, punctiform, minute, black, and thickly scattered over the spots on both sides of the leaves; sporulæ imperfectly developed. On leaves of *Menispermum Canadense*, Kansas.

3. PHYLLOSTICTA AFFINIS, E. & K. Am. Nat. 17, p. 1115.

Spots brown, lighter in the center, elongate or angular, .5—1 cm., border dark, elevated; perithecia yellowish, depressed, rather large, few, subcentral; sporulæ oblong, or oblong-elliptical, 4—6 x 2 μ. On Sassafras leaves. Probably only a synonym of P. Sassafras, Cke.

4. Phyllosticta Ampelopsidis, E. & M. N. A. F., No. 1169.

Spots light brown, subcircular, soon breaking out, 2—5 millim., border darker, narrow; perithecia dark brown, epiphyllous, scattered, mostly circinate in the spots, 100—150 μ; sporulæ hyaline, oval, ends obtuse, nucleate, 9 x 6 μ, exuding in white masses. On leaves of *Ampelopsis quinquefolia*. Pa. & N. J. "May be a variety of P. Labruscæ."

5. Phyllosticta Asiminæ, E. & K. N. A. F., No. 1164; Am Nat., 17 p., 1165.

Spots pale brown, irregular, .5—1 cm., border dark, narrow, raised; perithecia black, subglobose, barely erumpent, epiphyllous, scattered, 100 125 μ in diameter; sporulæ obovate, subhyaline, tinged with green, 7—9 x 5—6 μ. On leaves of *Asimina triloba*. Ohio.

6. Phyllosticta Catalpæ, E. & M. N. A. F., No. 1368; Am. Nat. 18 p., 189.

Spots pale brown, circular, 5—7 millim. in diameter, border darker; perithecia brown, lenticular, epiphyllous, scattered, often sterile, 112 x 84 μ; sporulæ subhyaline, oval, 5—7 x 2½—4½ μ. On leaves of *Catalpa bignonioides*. Pa.

7. Phyllosticta circumvallata, Winter, Journ. Mycol., I, p. 123.

"Spots grey, round, 5 millim. in diameter, border dark brown, elevated; perithecia scattered, mostly epiphyllous, lenticular, black, membranaceous, 100—120 μ in diameter; sporulæ elliptic, ends acuminate, hyaline, continuous, with two large nuclei, 7—9 x 3½—4 μ." On leaves of *Liriodendron Tulipifera*. Missouri.

8. Phyllosticta clethricola, E. & M. Am. Nat., 1882, p. 1002.

Spots pale brown, 2—10 millim. in diameter; perithecia erumpent, amphigenous; sporulæ subhyaline, ovate, guttulate, 9 x 6 μ. On leaves of *Clethra alnifolia*. N. J.

9. Phyllosticta cornicola (DC.) Rabh. Torrey Bull, 6. p., 351.

Spots epiphyllous, large, dark red, changing to pale in the center; perithecia few, punctiform, lenticular, erumpent, 150—200 μ in diameter; sporulæ oblong-elliptic, 2-guttulate, hyaline, 7—9 x 3—4 μ. On *Cornus*. N. America.

10. Phyllosticta Persicæ, Sacc. Mich. 1, p. 147.

Spots grey-brown, 4—5 millim. in diameter, breaking out in the center; perithecia brown, lenticular, epiphyllous, 112 μ in diameter; sporulæ subhyaline, with a slight tinge of green, ovate, or subcymbiform, 4—6 x 2—3 μ. On peach leaves. Ohio.

11. Phyllosticta Cratægi (Cke.), Sacc. Sylloge 3, p. 6.

Chilaria Cratægi, Cke. Grev., 12 p., 25. Rav., F. A., No. 516.

Perithecia light-brown, very delicate, hypophyllous, clustered, 130 μ; sporulæ hyaline, oblong, or oval, 6—12 x 1 μ (3 x 1½ μ, Sacc). On leaves of *Cratægus*. Carolina.

12. PHYLLOSTICTA FRAXINI, E. & M. Am. Nat., 18, p. 189; N. A. F., No. 1163.

Spots light-brown, ½—1 cm. in diameter, border dark purple, narrow; perithecia epiphyllous, scattered, black, lenticular, 130–150 μ in diameter; sporulæ oblong, or oblong-elliptical, hyaline, 1—2-nucleate, 7—9 x 2½—3 μ. On leaves of *Fraxinus*. Pa.

13. PHYLLOSTICTA GARRYÆ, Cke. & Hark Grev. 9, p. 84.

"Epiphyllous, spots elliptical, light grey, border purple; perithecia black, shining, slightly prominent; sporulæ narrow, elliptic, hyaline, continuous, 10—12 x 2—2½ μ." On *Garrya elliptica*. California.

14. PHYLLOSTICTA GLAUCA, Cke. *Septoria glauca*, Cke. Rav., F. A., No. 93.

Spots pallid, nearly round, 3—4 millim. in diameter, border dark brown, slightly raised; perithecia black, punctiform, epiphyllous, erumpent, 65—80 μ in diameter; sporulæ hyaline, oblong, 4 x 1 μ. On leaves of *Magnolia glauca*. S. Carolina.

15. PHYLLOSTICTA GORDONIÆ, E. & M. Journ. Mycol. 1, p. 100.

Spots dark brown, dry, occupying the ends and sides of the leaves; perithecia brown-black, subglobose, slightly erumpent, amphigenous, 120—140 μ in diameter; sporulæ hyaline, oblong, nucleate, 12 x 3 μ. On leaves of *Gordonia Lasianthus*. Florida

16. PHYLLOSTICTA GROSSULARIÆ, Sacc. Mich. 1, p. 136.

"Spots subcircular, sinuous, dry, grayish-white, margin dusky; perithecia punctiform, scattered, epiphyllous; sporulæ ovoid, or ellipsoid, hyaline, 5—6 x 3 μ." On leaves of *Ribes Grossularia*. N. America.

17. PHYLLOSTICTA HAMAMELIDIS, Cke. Rav., F. A., No. 511; Ellis, N. A. F., No. 1154.

Spots dark brown upon the upper surface, light brown on the under, definite, somewhat irregular in outline, 3—5 millim. in diameter; perithecia brown, hypophyllous, clustered, erumpent, 120—130 μ; sporulæ hyaline oval, or cylindric-oval, 2—3 x 1½ μ. On leaves of *Hamamelis Virginica*. S. Carolina.

18. PHYLLOSTICTA HETEROMELES, Cke. & Hark. Ellis, N. A. F., No. 751; Grev., 9, p. 84.

Epiphyllous; spots pallid, orbicular, or confluent, occupying most of the edge of the leaves, border black, raised; perithecia black, convex, mostly epiphyllous, erumpent, thickly aggregated, 130—200 μ; sporulæ hyaline, elliptic, continuous, 8 x 2 μ. On leaves of *Heteromeles*. California.

19. PHYLLOSTICTA LABRUSCÆ, Thuem. Ellis, N. A. F., No. 626.

Spots yellowish brown, 5 millim., suborbicular, border dark brown; perithecia black, subglobose, erumpent, circinate near the border, or clustered, epiphyllous, 112—120 μ in diameter; sporulæ subhyaline, oblong, ends round, 8—11 x 6—7 μ. On leaves of *Vitis Labruscæ*. N. Jersey.

20. Phyllosticta leucothoes, E. & M. Ellis, N. A. F., No. 1369.

Spots rusty brown, large, involving the apices or often the entire upper half of the leaves, distinctly limited; perithecia black, globose, few, scattered, epiphyllous, deeply immersed, or but slightly prominent, 150—200 μ in diameter; sporulæ hyaline, ovate, oblong, granular, or 2—3-nucleate, 15—21 x 6—7 μ. Differs from *P. terminalis* in color of spots and larger spores. On leaves of *Leucothoe acuminata*. Florida.

21. Phyllosticta liriodendrica, Cke. Sylloge 3, p. 30. *P. Liriodendri*, Cke. Grev. 12, p. 26.

Epiphyllous; spots orbicular, dusky, turning gray, border brown; perithecia few, punctiform, congregated in the center, black; sporulæ elliptical, hyaline, 6—8 x 2—3 μ. On leaves of *Liriodendron Tulipifera*. S. Carolina.

22. Phyllosticta Lychi, E. & K. Ellis, N. A. F., 1157.

Spots brown, turning white, circular, 1—2 millim., border thickened; perithecia black, lenticular, amphigenous, scattered, 100—140 millim. in diameter; sporulæ white, hyaline, elliptical, ends subacute, 6—12 x 2—3 μ. On leaves of *Lycium vulgare*. Ohio.

23. Phyllosticta Magnoliæ, Sacc. Mich.1, p. 139.

Spots large, gray-brown, covering the ends and sides of the leaves; peritnecia black, globose, erumpent, epiphyllous, 128—160 μ in diameter; sporulæ hyaline, oval, ends round, 6—2 x 3 μ ("4 x 1½—2 μ var. 8—12 x 3—4½ μ Sylloge 3, p. 25.") On leaves of *Magnolia grandiflora*. Florida.

24. Phyllosticta micropuncta, Cke. Texas Fungi, No. 47. Sylloge 3, p. 18.

Spots subcircular; perithecia black, lenticular, barely erumpent, scattered, epiphyllous, 64—80 μ in diameter; sporulæ hyaline, ovate, 3 x 1½ μ. On leaves of *Persea Caroliniensis*. Texas.

25. Phyllosticta Myricæ, Cke. Rav. F. A., No. 154. Ellis, N. A. F., No. 535.

"Spots suborbicular, red-brown; perithecia very small, covered, in little nests; sporulæ narrow, oval, hyaline, 7 μ long. Specimen No. 535, N. A. F., differs somewhat from the above published description, and is of doubtful identity. It has large brown irregular spots covering the ends and sides of the leaves; perithecia black, subglobose, immersed, epiphyllous, 160 μ in diameter; sporulæ oval, hyaline, 9—18 x 3—6 μ. On leaves of *Myrica cerifera*. S. Carolina and Florida.

26. Phyllosticta Nerii, West. Sylloge, 1, p. 26.

Spots oval, or suborbicular, light gray to white, 10—18 millim., border brown, elevated; perithecia amphigenous, at last erumpent, scattered, black, 200—250 μ; sporulæ hyaline, oval, 1—2-nucleate, 15 x 4—6 μ; ("15—18 x 5—6 μ, cloudy, or 1-guttulate." Sylloge.) On leaves of *Nerium Oleander*. Florida.

27. PHYLLOSTICTA NYSSÆ, Cke. Grev., 12, p. 26; Rav. F. A., No. 798.

Spots gray, large irregular, border purple; perithecia black, erumpent, punctiform, amphigenous, 65—95 μ; sporulæ hyaline, subelliptic, 3½ x 1½ μ. On leaves of *Nyssa capitata*. Georgia.

28. PHYLLOSTICTA OLEÆ, E. & M.

Spots gray, large, occupying the apices and sides of the leaves, border brown, elevated, perithecia black, subglobose, prominent, mostly epiphyllous, about 140 μ in diameter; sporulæ hyaline, oblong oval, 18—24 x 3—4 μ. On leaves of *Olea Americana*. Florida.

29. PHYLLOSTICTA PERSEÆ, E. & M. Journ. Mycol., 1, p. 100.

Spots brownish-gray, large, covering the ends and sides of the leaves; perithecia brown-black, lenticular, erumpent, epiphyllous, 150—300 μ; sporulæ hyaline, oblong, nucleate, 3—8 x 1—3 μ. On leaves of *Persea Carolinensis*. Florida.

Mr. Ellis now thinks this is identical with *P. micropuncta*, Cke., and will have to be dropped. I have retained it for the present, however, as, from the specimens at my command, I have not been able to satisfy myself that it is so.

30. PHYLLOSTICTA PHOMIFORMIS, Sacc. Mich. 1, p. 573. Ellis, N. A. F., No. 1160.

Spots pallid, 3—5 millim., border brown, slightly elevated; perithecia loosely clustered, globose-lenticular, erumpent, amphigenous, black, 130—150 μ; sporulæ oblong, ends acutish, granular, hyaline, 20—22 x 8—10 μ, basidia short, attenuated upwards. On leaves of *Quercus alba*. Pa.

31. PHYLLOSTICTA PLATANI, Sacc. et Speg. Mich. 1, p. 153.

Spots large brown, turning gray; perithecia dark brown, lenticular, erumpent, mostly hypophyllous, 90 μ in diameter; sporulæ hyaline, oblong, 4 x 1 μ.

"Spots obsolete; perithecia scattered, punctiform, lenticular, yellow; sporulæ ovoid-oblong, 5—6 x 1—1½ μ, minutely 2-guttulate, cloudy, hyaline" (Michelia). On leaves of *Platanus*. Kansas.

32. PHYLLOSTICTA PYRORUM, Cke. Grev. 12, p. 26. Rav., F. A., No. 512.

Spots white, large, often occupying the half or whole of a leaf, margin purple; perithecia black, scattered, convex, epiphyllous; sporulæ linear, straight, or curved, hyaline, 10 x 2 μ. On pear leaves. S. Carolina.

33. PHYLLOSTICTA PYRINA, Sacc. Mich. 1, p. 134. Ellis, N. A. F., No. 1370.

Spots gray-brown, occupying the apices and sides of the leaves; perithecia black, flattened, erumpent, epiphyllous, 130—155 μ; sporulæ hyaline, slightly smoky, ovoid, ends obtuse, 4½—6 x 3 μ. "Spots pallid, dry, variable; perithecia mostly epiphyllous, punctiform, lenticular, erum-

pent, 100—130 μ in diameter; structure loosely cellular, ferruginous; sporulæ hyaline, ovoid, or ellipsoid, 4—1 x 2—2½ μ." (Michelia.) On *Pyrus*. N. J.

34. PHYLLOSTICTA QUERCUS RUBRÆ, W. R. Gerard. Bull. of Torrey Club, 1875-78.

"Spots few, subcircular, or irregular, white, border red; perithecia epiphyllous, numerous, minute, globose, black, collected in the center of the spots; sporulæ very small, ovoid." On leaves of *Quercus rubra*. New York.

35. PHYLLOSTICTA SASSAFRAS, Cke. Grev. 12, p. 26. Rav. F. A., No. 515.

Epiphyllous; spots orbicular, gray-brown, or dusky; perithecia numerous, at times circinate, scattered, black; "sporulæ hyaline, elliptic, lanceolate, 7 x 1½ μ." On leaves of *Sassafras officinlis*. S. Carolina.

In the American Naturalist, 17, p. 1115, Ellis & Kellerman state that the sporulæ are "globose, brown, coarsely granular." This is probably an error. My specimen in F. A. is sterile.

36. PHYLLOSTICTA SEROTINA, Cke. Grev. 12, p. 26. Rav., F. A., No. 513.

Spots light brown, orbicular, border darker, narrow, obscure; perithecia dark brown, epiphyllous, scattered, punctiform, 150 μ in diameter; sporulæ hyaline, slightly smoky, elliptic-lanceolate, 6 x 3—4 μ ("12 x 3 μ"). On leaves of *Cerasus serotina*. S. Carolina, N. Jersey and Kansas.

37. PHYLLOSTICTA SINUOSA, E. & M. Am. Nat., 18, p., 1264. Ellis, N. A. F., No. 1367.

Spots orbicular, reddish-brown, turning nearly white, mostly 2—3 millim. in diameter; perithecia black, lenticular, epiphyllous, scattered, mostly near the margin of the spots, 150 μ in diameter; sporulæ hyaline, oblong, or clavate-oblong, 6—15 x 1—2 μ. On leaves of *Olea Americana*. Florida.

38. PHYLLOSTICTA SPHÆROPSOIDEA, E. & E. Ellis, N. A. F., No. 1159. Bull. Torrey Bot. Club, 10, p. 97.

Spots reddish-brown, 1—2 cm. in diameter. Sometimes confluent, border light yellow; perithecia brown, scattered, punctiform, epiphyllous, but visible beneath, 120 μ; sporulæ globose, or ovoid, hyaline, granular, 1—2-nucleate, 12—15 x 8—10 μ; basidia stout. On living leaves of *Aesculus hippocastanum*. Newfield, N. J.

39. PHYLLOSTICTA TERMINALIS, E. & M. Am. Nat., 18, p. 70. Ellis, N. A. F., No. 1167.

Spots large, brown, becoming nearly white, border purple, black, narrow; perithecia black, globose, slightly prominent beneath the cuticle, epiphyllous, 100—120 μ in diameter; sporulæ hyaline, ovoid, ends obtuse, 15 x 4½ μ. On leaves of *Ilex Dahoon*. Florida.

40. PHYLLOSTICTA TOXICODENDRI, Thum. Sylloge, 3, p. 17.

"Spots small, reddish-brown, irregular, or subcircular, border dark red; perithecia epiphyllous, scattered, or solitary, black, medium, lenticular; sporulæ ellipsoid, hyaline, guttulate, 1½ x 1 μ." On leaves of *Rhus Toxicodendron*. S. Carolina.

41. PHYLLOSTICTA TOXICA, E. & M. Ellis, N. A. F., No. 1162. Am. Nat., 1882, p. 1002.

Spots gray, round, small, border dark brown; perithecia black, epiphyllous, innate, 70 μ in diameter; sporulæ subhyaline, oval, subglobose, granular, 6–7½ μ. On fading leaves of *Rhus Toxicodendron*. Iowa.

42. PHYLLOSTICTA VESICATORIA, Thum. Sylloge, 3, p. 34.

"Spots large, dry, visicular, brown, border purple; perithecia epiphyllous, scattered, globose, semi-immersed, medium, black, ostiolate; sporulæ minute ellipsoid-cylindrical, ends round, straight hyaline, 2½ x 1½ μ." On leaves of *Quercus cinerea*. S. Carolina.

43. PHYLLOSTICTA VITICOLA, Thum. Sylloge, 3, p. 20. *Septoria viticola*, Berk.

"Spots large, subcircular, gray-brown beneath, brownish-purple above, determinate; perithecia amphigenous, but often hypophyllous, few, minute, globose; sporulæ short, ellipsoid, 1-guttulate, 8—9 x 4 μ, hyaline." On leaves of *Vitis vulpina*. S. Carolina.

44. PHYLLOSTICTA MENTZELIÆ, E. & K. Journ. Mycol., II, p. 4.

Spots pallid, orbicular, or oval, 5—8 millim.; perithecia amphigenous, dusky, innate-erumpent, subglobose, 100—130 μ in diameter, scattered, several in a spot; sporulæ oblong-oval, subhyaline, slightly dusky, 7 x 3 μ. On leaves of *Mentzelia nuda*. Western Kansas.

45. PHYLLOSTICTA VULGARIS, Desm. Sylloge, 3, p. 18.

"Spots subcircular, reddish-olive at first, then pallid, margin gray-brown; perithecia slightly prominent, very small, globose-depressed amber-colored at first, then dusky; sporulæ minute, cylindric-ovate, obtuse, 2-guttulate, hyaline, 10—14 x 2½—3½ μ." On fading leaves of *Lonicera*, etc.

B. Those found on herbaceous plants.

46. PHYLLOSTICTA AMARANTHI, E. & K. Journ. Mycol., 1, p. 4.

Spots reddish-brown, 2—4 millim. in diameter, border dark, slightly raised; perithecia brown, erumpent, epiphyllous, 120—150 μ in diameter, 6—12 in a spot; sporulæ subhyaline, elliptical, 1—2-nucleate, 9—11 x 3—5 μ. On leaves of *Amaranthus retroflexus*. Kansas.

47. PHYLLOSTICTA ASTRAGALI, Pk. Bot. Gazette, 1881, p. 275.

"Spots obsolete; perithecia numerous, often amphigenous, 180—230 μ in diameter, partially covered by the fissured epidermis; sporulæ hyaline, oblong, or oblong-fusiform, 13—16 x 3 μ." On leaves of *Astragalus*, living and dead. Canada.

pent, 100—130 μ in diameter; structure loosely cellular, ferruginous; sporulæ hyaline, ovoid, or ellipsoid, 4—4 x 2—2½ μ." (Michelia.) On *Pyrus*. N. J.

34. PHYLLOSTICTA QUERCUS RUBRÆ, W. R. Gerard. Bull. of Torrey Club, 1875-78.

"Spots few, subcircular, or irregular, white, border red; perithecia epiphyllous, numerous, minute, globose, black, collected in the center of the spots; sporulæ very small, ovoid." On leaves of *Quercus rubra*. New York.

35. PHYLLOSTICTA SASSAFRAS, Cke. Grev. 12, p. 26. Rav. F. A., No. 515.

Epiphyllous; spots orbicular, gray-brown, or dusky; perithecia numerous, at times circinate, scattered, black; "sporulæ hyaline, elliptic, lanceolate, 7 x 1½ μ." On leaves of *Sassafras officinlis*. S. Carolina.

In the American Naturalist, 17, p. 1115, Ellis & Kellerman state that the sporulæ are "globose, brown, coarsely granular." This is probably an error. My specimen in F. A. is sterile.

36. PHYLLOSTICTA SEROTINA, Cke. Grev. 12, p. 26. Rav., F. A., No. 513.

Spots light brown, orbicular, border darker, narrow, obscure; perithecia dark brown, epiphyllous, scattered, punctiform, 150 μ in diameter; sporulæ hyaline, slightly smoky, elliptic-lanceolate, 6 x 3—4 μ ("12 x 3 μ"). On leaves of *Cerasus serotina*. S. Carolina, N. Jersey and Kansas.

37. PHYLLOSTICTA SINUOSA, E. & M. Am. Nat., 18, p., 1264. Ellis, N. A. F., No. 1367.

Spots orbicular, reddish-brown, turning nearly white, mostly 2—3 millim. in diameter; perithecia black, lenticular, epiphyllous, scattered, mostly near the margin of the spots, 150 μ in diameter; sporulæ hyaline, oblong, or clavate-oblong, 6—15 x 1—2 μ. On leaves of *Olea Americana*. Florida.

38. PHYLLOSTICTA SPHÆROPSOIDEA, E. & E. Ellis, N. A. F., No. 1159. Bull. Torrey Bot. Club, 10, p. 97.

Spots reddish-brown, 1—2 cm. in diameter. Sometimes confluent, border light yellow; perithecia brown, scattered, punctiform, epiphyllous, but visible beneath, 120 μ; sporulæ globose, or ovoid, hyaline, granular, 1—2-nucleate, 12—15 x 8—10 μ; basidia stout. On living leaves of *Aesculus hippocastanum*. Newfield, N. J.

39. PHYLLOSTICTA TERMINALIS, E. & M. Am. Nat., 18, p. 70. Ellis, N. A. F., No. 1167.

Spots large, brown, becoming nearly white, border purple, black, narrow; perithecia black, globose, slightly prominent beneath the cuticle, epiphyllous, 100—120 μ in diameter; sporulæ hyaline, ovoid, ends obtuse, 15 x 4½ μ. On leaves of *Ilex Dahoon*. Florida.

40. PHYLLOSTICTA TOXICODENDRI, Thum. Sylloge, 3, p. 17.

"Spots small, reddish-brown, irregular, or subcircular, border dark red; perithecia epiphyllous, scattered, or solitary, black, medium, lenticular; sporulæ ellipsoid, hyaline, guttulate, 1½ x 1 μ." On leaves of *Rhus Toxicodendron*. S. Carolina.

41. PHYLLOSTICTA TOXICA, E. & M. Ellis, N. A. F., No. 1162. Am. Nat., 1882, p. 1002.

Spots gray, round, small, border dark brown; perithecia black, epiphyllous, innate, 70 μ in diameter; sporulæ subhyaline, oval, subglobose, granular, 6–7½ μ. On fading leaves of *Rhus Toxicodendron*. Iowa.

42. PHYLLOSTICTA VESICATORIA, Thum. Sylloge, 3, p. 34.

"Spots large, dry, visicular, brown, border purple; perithecia epiphyllous, scattered, globose, semi-immersed, medium, black, ostiolate; sporulæ minute ellipsoid-cylindrical, ends round, straight hyaline, 2½ x 1½ μ." On leaves of *Quercus cinerea*. S. Carolina.

43. PHYLLOSTICTA VITICOLA, Thum. Sylloge, 3, p. 20. *Septoria viticola*, Berk.

"Spots large, subcircular, gray-brown beneath, brownish-purple above, determinate; perithecia amphigenous, but often hypophyllous, few, minute, globose; sporulæ short, ellipsoid, 1-guttulate, 8—9 x 4 μ, hyaline." On leaves of *Vitis vulpina*. S. Carolina.

44. PHYLLOSTICTA MENTZELIÆ, E. & K. Journ. Mycol., II, p. 4.

Spots pallid, orbicular, or oval, 5—8 millim.; perithecia amphigenous, dusky, innate-erumpent, subglobose, 100—130 μ in diameter, scattered, several in a spot; sporulæ oblong-oval, subhyaline, slightly dusky, 7 x 3 μ. On leaves of *Mentzelia nuda*. Western Kansas.

45. PHYLLOSTICTA VULGARIS, Desm. Sylloge, 3, p. 18.

"Spots subcircular, reddish-olive at first, then pallid, margin gray-brown; perithecia slightly prominent, very small, globose-depressed amber-colored at first, then dusky; sporulæ minute, cylindric-ovate, obtuse, 2-guttulate, hyaline, 10—14 x 2½—3½ μ." On fading leaves of *Lonicera*, etc.

B. Those found on herbaceous plants.

46. PHYLLOSTICTA AMARANTHI, E. & K. Journ. Mycol., 1, p. 4.

Spots reddish-brown, 2—4 millim. in diameter, border dark, slightly raised; perithecia brown, erumpent, epiphyllous, 120—150 μ in diameter, 6—12 in a spot; sporulæ subhyaline, elliptical, 1—2-nucleate, 9—11 x 3—5 μ. On leaves of *Amaranthus retroflexus*. Kansas.

47. PHYLLOSTICTA ASTRAGALI, Pk. Bot. Gazette, 1881, p. 275.

"Spots obsolete; perithecia numerous, often amphigenous, 180—230 μ in diameter, partially covered by the fissured epidermis; sporulæ hyaline, oblong, or oblong-fusiform, 13—16 x 3 μ." On leaves of *Astragalus*, living and dead. Canada.

48. Phyllosticta Apocyni, Trelease, Prelim. List. par. Fungi. of Wis., p. 17. Am. Nat. 18 p., 1264. (P. Apocyni, E. & M.)

Spots brown, round, 1—2 millim. in diameter, border dark, narrow, slightly raised; perithecia dark brown, subglobose, erumpent, epiphyllous, mostly in the middle of the spots, 75 μ in diameter; sporulæ subhyaline, oval, contents granular, 7—9 x 6 μ. On leaves of *Apocynum cannabinum*. N. Jersey.

The publication of this species by Prof. Trelease appears to have priority, his paper above cited bearing date Nov., 1884, and that of E. & M., December, of the same year.

49. Phyllosticta bataticola, E. & M. Ellis, N. A. F., No. 1155. Am. Nat., 1882, p. 1002.

Spots small, white, round, 1—2 millim., border purplish; perithecia subglobose, black, few, innate, epiphyllous, 70—100 μ; sporulæ oblong-elliptical, hyaline, 5—6 x 2—3 μ. On leaves of *Batatas*. N. Jersey.

50. Phyllosticta Batatas, Cke. Rav., F. A., No. 264. Grev., 7, p. 35. *Depazea Batatas*, Thum. Myc. Univ., No. 598.

Spots pallid, subregular, 2—4 millim.; perithecia black, epiphyllous, covered by the epidermis, 100—125 μ; sporulæ hyaline, oval, 6—7½ x 4½ μ. On leaves of *Convolvulus*.

51. Phyllosticta Chenopodii, West. Ellis, N. A. F., No. 1158.

Spots pallid, nearly round, 3—5 millim. in diameter; perithecia black, erumpent, scattered, epiphyllous, but visible on both sides of the leaves, 130—160 μ; sporulæ white, hyaline, oval, ends obtuse, 10—15 x 3 μ. On leaves of *Chenopodium album*. P. Chenopodii, Sac. Mich 1, p. 150, appears to be a different species, and has not been reported as found in N. A.

52. Phyllosticta Cornuti, E. & K. Torrey Bull., 11, p. 115.

Spots indistinct, brown, nearly round, or limited by the veinlets, more or less confluent, 2—3 millim.; perithecia black, thickly scattered, slightly erumpent, amphigenous, 90—100 μ; sporulæ slightly colored, oblong-cylindric, or oval, 5 x 4 μ; "3 x 1 μ," (E. & K.) On leaves of *Asclepias Cornuti*. Kansas.

53. Phyllosticta cruenta, Fr. Ellis, N. A. F., No. 752. Mich., 1, p. 142.

Spots pallid, suborbicular, or ovoid, 3—10 millim., sometimes confluent, border dark-brown; perithecia olive-black, erumpent, gregarious, epiphyllous, 200 μ in diameter; sporulæ hyaline, oval, or "ovate-oblong, curved," granular, 12 x 9 μ; "14—16 x 5½—6½ μ." On leaves of *Smilacina racemosa*. Pa.

54. Phyllosticta decidua, E. & K. Ellis, N. A. F., No. 1165. Am. Nat., 17, p. 1165.

Spots thin, white, subangular, often confluent and irregular, soon breaking out, 1—2 millim., margin definite, scarcely raised; perithecia dark-brown, subglobose, epiphyllous, but visible on both surfaces of the leaves, sparse, 60—100 μ; sporulæ subhyaline, oblong-elliptical, 3—7 x 1½—3 μ; "mostly 3—4 x 1½ μ, the longest with 2—3 faint nuclei." On leaves of *Lemurus cardiaca*. Ohio.

(To be continued.)

AMANITINE AND ITS ANTIDOTE.

BY CHARLES MACILVAINE, OF PHILADELPHIA.

(Concluded from page 9.)

The caps range in color from the bright scarlet of the Amanita muscarius, or poison-fly agaric, to the lemon-yellow of the A. mappa, and pure satiny white of the A. bemus and A. phalloid. Their stems are free from the gills, and are surrounded near the top with a kid-like apron or ring. At the base of the stem is a *bulb which is covered with a sheath or volva*. From this sheath or volva the poisonous Amanita invariably springs. As the investing membrane, in the shape of warts, ring, or volva, is frequently evanescent, one or all may be absent in aged plants; but the volva or remains of it, is almost universally found, if the plant is carefully removed from the ground. They grow in woods, uncultivated ground, on the margin of pastures near woods in fence corners, and by their great resemblance when young to the common mushroom are frequently mistaken for it. The common mushroom never has a volva, and is seldom found in woods. It has pink and purple gills, and a much shorter stem than the Amanita.

To Mr. Julius A. Palmer, of Boston, is due the segregation of the Amanita group, and the pointing to it as the only one known to contain the subtile deadly alkaloid which is the subject of this article—Amanitine.

In an article from his pen, contributed to the *Moniteur Scientifique*, of Paris, 1879, he says: "Mushrooms are unfit for food by decay, or other cause producing simply a disagreement with the system, by containing some bitter, acrid, or slimy element, or by the presence of a wonderful and dangerous alkaloid which is absorbed in the intestinal canal. This alkaliloid, so for as is known, is found only in the Amanita family."

So long ago as 1868, Drs. Currie, Vigier, Smidberg, and Koppe, isolated this alkaloid, and it has formed a part of our pharmacopia since that time.

The toxic properties of the Amanita have long been known. The inhabitants of Northern Russia drink a decoction of, or eat the dried Amanita muscarius (poison-fly agaric) for the purposes of narcotism and intoxication, and the urine of those who have partaken of it is in demand for future orgies, which is similar to those produced by alcohol.

M. Sicard, author of the "Histoire Naturelle des Champignons Comestibles et Vinineux," Paris, 1883, experimented with Amanitine on dogs. He says: "Recently I have sought an appropriate antidote—an antidote of which the effects after absorption should be diametrically opposed in the system to those produced by the alkaloid of the mushroom—defined as an acrid and stupefying poison." After the absorption of the poison by a dog, M. Sicard, in following up his theory, injected subcutaneously two milligrammes of nitrate of pilocarpine, and a half hour afterwards a second injection with the same dose. After friction and the administra-

tion of five grammes of nitrate of potash dissolved in one hundred grammes of a solution of marshmallows, the dog recovered. "In strict truth," says M. Sicard, "I must say that the dog never recovered his normal condition; but the progress of the poison ceased, and he at least lived."

Dr. Gautier, in a work entitled "Les Champignons," Paris, 1884, says: "The use of atropine has been advised, not only to combat narcotic symptoms, such as those produced by opium poisoning, but as an antidote for muscarine—not yet perfectly isolated from the Amanita muscarius." The experiments that we have made upon animals in order to study the antagonism of atropine, and reciprocally, against the toxic elements of the Amanita bulbosus, Amanita muscarius, etc., have furnished negative results only. Yet it would be irrational to conclude that it lacked in efficacy upon man; and in all cases of poisoning by toad-stools where nervous symptoms are manifested, it would be prudent to try the use of atropine in the dose of from ½ to 0.002 of a milligramme.

The experience that we have reached in the search for an antidote against the action of the poisons of the Amanita, Lactarius, etc., by means of the subcutaneous injection of many substances, have given equally negative results. It is, however, important to continue these experiments, especially in the presence of the results obtained by Letellier. (The experiments of Letellier were confined to attempting the precipitation of the poison by the use of tannin.)

Experiments upon frogs were made with atropine, using it as the antidote for Amanitine, and *vice versa*, with pronounced success; but not until August, 1885, was atropine successfully brought face to face with Amanitine in the human system, as happened in the case of toad-stool poisoning in the Faris family, of Shenandoah, Pa., coming under the charge of Dr. S. E. Shadle, of that place, whose report will be found very valuable as indicating the symptoms of poisoning from eating of the Amanita vernus, and the treatment pursued by him.

Immediately upon noticing these cases of poisoning in the public prints, the writer addressed a letter of inquiry to Shenandoah, which was fully responded to by Dr. Shadle, and samples of the toadstools eaten by the Faris family—selected by Mr. Faris, one of the survivors of the poisoning—were forwarded for identification.

Of those samples, two were harmless agarics and the other a white agaric—Amanita vernus—one of the poisonous varieties of the Amanita. At the writer's request, Dr. Shadle wrote the following report in answer to numerous queries: * * * * * * *

The report of Dr. Shadle corroborates all former observations of the poisoning by Amanitine, in that the poison does not manifest itself until from eight to fifteen hours after ingestion and the peculiar dusky hue of the skin as one of its marked symptoms.

In relation to the latter, Mr. Palmer writes: "The absorption of the poison from the Amanita may take place not only by ingestion, but by contact with the skin, as through the hollow palm of the hand or arm: by the lungs, as I have proven by personal experiments made upon my-

self. In such a case the patient has all of the symptoms of having eaten of the mushrooms, *even to a peculiar leaden or ash-colored complection.*"

The possession of specimes of the toadstools eaten, the identification of an Amanita among them or not, as the case may be, the length of time elapsing between the eating and manifestations of the poison, will inform the physician as to whether or not Amanitine is at work and whether it must be met by atropine, or the case treated for a less virulent poison by milder remedies.

NOTES ON FLORIDA FUNGI--No. 2.

BY W. W. CALKINS, CHICAGO, ILLINOIS.

The numerous and richly-developed species of *Polypori* naturally attract the explorer's first attention in a Florida forest. In a hard-wood hammock, near Jacksonville, a large oak (*Quercus laurifolia*) may be seen in a half-decayed state. On the trunk, occupying a space twenty feet long and one foot wide, appears *Polyporus gilvus*, Fr. This is the largest specimen I have ever heard of. On the Pipe wood (*Leucothoe acuminata*) also on the *Magnolia* and *Ulmus*, the living bark is made brilliant by those peculiar rosette-like forms—*Hypochnus albocinctus*, Mont., and *H. rubrocinctus*, Ehrb.

The Lichenologists claim these species also, but they are very interesting, all the same. These are found in perfect fruit here during the winter months, when it is cool and there are frequent rains. The summers are long, dry and very hot, therefore not many fungous forms attain their full maturity. To see a whole forest of magnificent trees and shrubs, many of them strictly Southern plants, adorned with extraneous life of lower vegetable orders, lends variety and charm not to be found elsewhere, unless it be in a tropical jungle.

NEW LITERATURE.

"REFUTATION DE L'OPINION DU DR. G. EUGEL TOUCHANT LES QUALITES COMESTIBLES DE L'AMANITA MUSCARIA, FR." Cap. F. Sarrazin. Revue Mycologique, 1er Janvier, 1886.

"FUNGI GALLICI EXSICCATI.—CENTURIE XXXVIe." C. Roumeguere. l. c.

"CHAMPIGNONS NOUVEAUX OU RARES DE L'AUBE.—FASC. II." Par le Major Briard. l. c.

"CHAMPIGNONS DU BEARN (2E LISTE)." Par MM. E. Doassans et N. Patouillard. l. c.

MYCOTHECA UNIVERSALIS.

A set, consisting of 23 cents. of this valuable collection is offered for sale by Baron F. de Thuemen, St. Michæl, a' Etsch., Austria, at the low price of $50.00.

TABLE OF CONTENTS.

PAGE.

THE PHYLLOSTICTAS OF NORTH AMERICA - - - - - - 13
AMANITINE AND ITS ANTIDOTE - - - - - - - - - 21
NOTES ON FLORIDA FUNGI - - - - - - - - - - 23
NEW LITERATURE - - - - - - - - - - - - 23

PAGE.

Depazea Batatas, Thum 20
Phyllosticta, Pers 13
Phyllosticta acericola, Cke 13
Phyllosticta abortiva, E. & K 13
Phyllosticta affinis, E. & K 13
Phyllosticta Amaranthi, E. & K 20
Phyllosticta Ampelopsidis, E. & M 14
Phyllosticta Apocyni, Trel 19
Phyllosticta Asiminæ, E. & K 14
Phyllosticta Astragali, Pk 19
Phyllosticta bataticola, E. & M 20
Phyllosticta Batatas, Cke 20
Phyllosticta Catalpæ, E. & M 14
Phyllosticta Chenopodii, West 20
Phyllosticta circumvallata, Winter 14
Phyllosticta clethrifolia, E. & M 15
Phyllosticta cornicola (D. C.) 14
Phyllosticta Cornuti, E. & K 20
Phyllosticta Crataegi (Cke.) 14
Phyllosticta cruenta, Fr 20
Phyllosticta decidua, E. & K 20
Phyllosticta Fraxini, E. & M 15
Phyllosticta Garryæ, Cke. & Hk 15
Phyllosticta Gaultheriæ, E. & E 20
Phyllosticta glauca (Cke.) 15
Phyllosticta Gordoniæ, E. & M 15
Phyllsstieta Grossulariæ, Sacc 15
Phyllosticta Hamamelidis, Cke 15
Phyllosticta Heteromeles, Cke. & Hk 15
Phyllosticta Labruscæ, Thm 15

PAGE.

Phyllosticta Leucothoes, E. & M 16
Phyllosticta Liriodendri, Cke 16
Phyllosticta liriodendrica, Cke 16
Phyllosticta Lycii, E. & K 16
Phyllosticta Magnoliæ, Sacc 16
Phyllosticta Mentzeliæ, E. & K 19
Phyllosticta micropuncta, Cke 16
Phyllosticta Myricæ, Cke 16
Phyllosticta Nerii, West 16
Phyllosticta Nyssæ, Cke 17
Phyllosticta Oleæ, E. & M 17
Phyllosticta Perseæ, E. & M 17
Phyllosticta Persicæ, Sacc 17
Phyllosticta phomiformis, Sacc 17
Phyllosticta Platini, S & S 17
Phyllosticta pyrina, Sacc 17
Phyllosticta Pyrorum, Cke 17
Phyllosticta Quercus rubræ, Ger 18
Phyllosticta Sassafras, Cke 18
Phyllosticta serotina, Cke 18
Phyllosticta sinuosa, E. & M 18
Phyllosticta sphæropsoides, E. & E 18
Phyllosticta terminalis, E. & M 18
Phyllosticta toxica, E. & M 19
Phyllosticta Toxicodendri, Thum 18
Phyllosticta vesicatoria, Thuem 19
Phyllosticta viticola, Thuem 19
Phyllosticta vulgaris, Desm 19
Septoria glauca, Cke 15
Sphæropsis minima, B. & C 13